HW-101 HW-moisture sensor V1.2

Specification

Features

1. New soil moisture sensor. This capacitive soil moisture sensor is different from most resistive sensors on the market. It uses the principle of capacitive sensing to detect soil moisture. The problem that the resistance sensor is easily corroded is avoided, and its working life is greatly extended.

2. The sensor has a built-in voltage regulator chip, which supports a 3.3~5.5V wide voltage working environment, which means that it can work normally even on the 3.3V Arduino main control board. The iconic DFRobot-Gravity interface ensures the compatibility of the interface and can be directly connected to the Gavity IO expansion board.

3. A micro PC such as a Raspberry Pi only needs an external ADC (analog signal to digital signal) conversion module to work.

4. With an external screen and a motherboard, you can talk to your plant to see if the beloved one is thirsty, and whether it needs a little more water.

Product parameters

Working voltage: 3.3 ~ 5.5 VDC

Output voltage: 0 ~ 3.0 VDC

Interface: PH2.54-3P

Size: 98 x 23mm (LxW)

Instructions

Prepare

Hardware

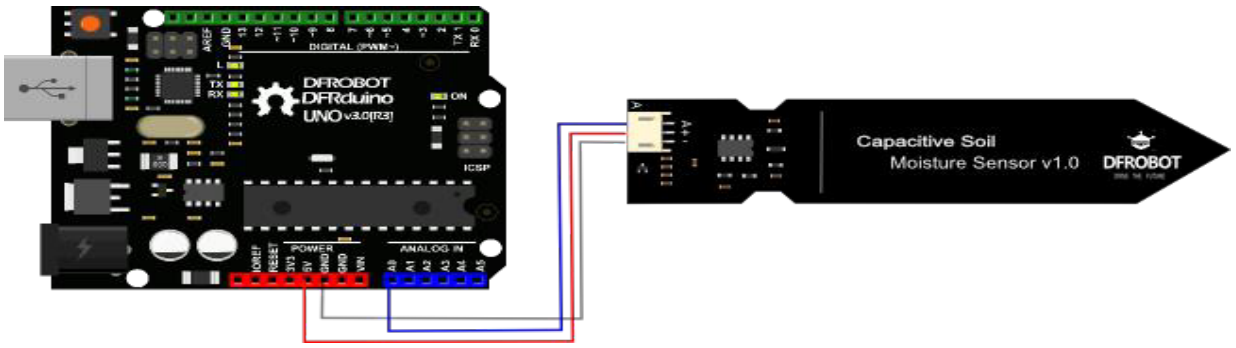
- UNO control board x1
- Soil moisture sensor x1
- PH2.54-3P wiring x1

Software

- Arduino IDE V1.6.5

Wiring diagram

1. Connect the sensor and the main control board as shown



Calibration code

1. Before officially testing the soil moisture, a calibration process is required;

2. Burn in the calibration code to the Arduino main control board;

3. Open the serial monitoring assistant.

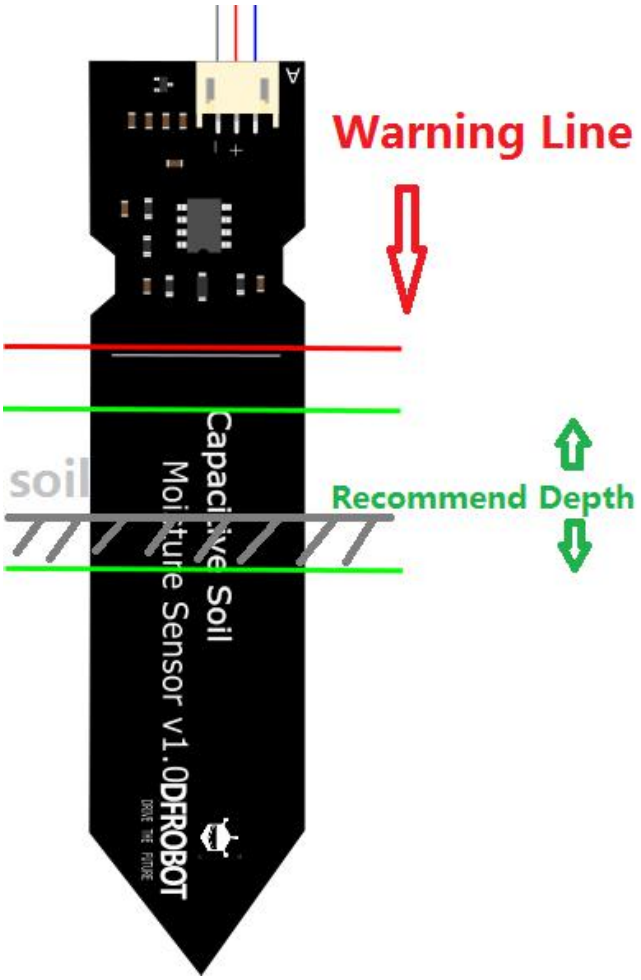
```
void setup() {
  Serial.begin(9600); // open serial port, set the baud rate to 9600 bps
}
void loop() {
  int val;
  val = analogRead(0); //connect sensor to Analog 0
  Serial.print(val); //print the value to serial
  delay(100);
}
```

Calibration procedure

Dry humidity calibration

Calibration instructions: define a measurement range by reading the sensor values in air and water respectively.
Open the serial monitor and set the baud rate to 9600 according to the program.

First, place the sensor in the air to read the analog value, which represents the reading when dry. Then take a glass of water, insert the sensor into the water to a certain depth (make a mark, this depth is the depth you will insert into the soil), must not exceed the red warning line! And record the analog value read at this time, which represents 100% humidity. (The output data is inversely proportional to the humidity, and the output in the water is the smallest.) The insertion depth is recommended as shown in the figure.



Interval setting

Because the sensor value will be affected by the depth of the soil and the tightness of the soil, only the relative humidity of the soil can be detected. We divide the range of humidity into three equal parts, which means dry, humid, and very humid. The two data recorded before are the humidity interval. For example: the reading in the air is 520, and the reading in the water is 260, so it can be divided into (520,430), (430,350], (350,260). These three sections represent dry, wet, and very humid.

Note: Since this sensor will monitor soil moisture based on the principle of capacitive sensing, placing it in different places with different soil moisture, different tightness, and different insertion depth will reflect different humidity, even in the same place, at the same depth, at During the second insertion, since the first extraction has caused loosening of the soil, the humidity may be lower than the first reading. A

Note: Humidity is inversely proportional to the reading.

Test code

Bring the two sets of data just recorded into your test code.

```
/************************************************
 This example reads Capacitive Soil Moisture Sensor.

 Created 2015-10-21
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```

```
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/***********Notice and Trouble shooting**************
 1.Connection and Diagram can be found here
 2.This code is tested on Arduino Uno.
 ****************************************************/

const int AirValue = 520;   //you need to change this value that you had recorded in the air
const int WaterValue = 260;  //you need to change this value that you had recorded in the water
int intervals = (AirValue - WaterValue)/3;
int soilMoistureValue = 0;
void setup() {
  Serial.begin(9600); // open serial port, set the baud rate to 9600 bps
}
void loop() {
soilMoistureValue = analogRead(A0);  //put Sensor insert into soil
if(soilMoistureValue > WaterValue && soilMoistureValue < (WaterValue + intervals))
{
  Serial.println("Very Wet");
}
else if(soilMoistureValue > (WaterValue + intervals) && soilMoistureValue < (AirValue - intervals))
{
  Serial.println("Wet");
}
else if(soilMoistureValue < AirValue && soilMoistureValue > (AirValue - intervals))
{
  Serial.println("Dry");
}
delay(100);
}
```

RFQ

Q 1. Why is my reading very different from the actual value, I use your Romeo?

A：Hello! Because Romeo's analog port A0 has an external button, please set the switch next to the button to Off, or use another analog port.